

*ADDITIONAL*

 **PIONEER®**

# *Service Manual*

**ORDER NO.  
ARP-818-0**

**FM/AM DIGITAL SYNTHESIZER TUNER**

# **TX-220Z**

**ZEZ**

# **TX-221Z**

**ZEZ**

- For servicing these type, please refer to the F-X20ZL service manual (ARP-719) with the exception of this additional service manual.
- This additional service manual is applicable to ZEZ type.

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## 1. SPECIFICATIONS

### FM Tuner Section

Frequency range	87.5 MHz to 108 MHz
Usable Sensitivity	11.2 dBf, IHF (1.0 V/75 ohms)
Sensitivity (DIN)	Mono: 0.9 $\mu$ V / 75 ohms Stereo: 31.5 $\mu$ V / 75 ohms
Signal-to-Noise Ratio (IHF, 85 dBf Input)	Mono: 77 dB Stereo: 73 dB
Signal-to-Noise Ratio (DIN)	Mono: 66 dB Stereo: 60 dB
Distortion	Stereo: 0.4% (1 kHz)
Alternate Channel Selectivity	67 dB (400 kHz)
Stereo Separation	40 dB (1 kHz)
Antenna Input	300 ohm balanced 75 ohm unbalanced

### MW Tuner Section

Frequency range	531 kHz to 1602 kHz
Sensitivity (IHF, Loop antenna)	300 $\mu$ V / m
Signal-to-Noise Ratio	50 dB
Antenna	Loop Antenna

### Miscellaneous

Dimensions	420(W) x 58(H) x 215(D) mm
Weight (without package)	1.9 kg

### Furnished Parts

FM T-type Antenna	1
AM Loop Antenna	1
Coaxial connector	1
Connection Cable	1

## 2. CONTRAST OF MISCELLANEOUS PARTS

TX-220Z/ZEZ and TX-221Z/ZEZ types are the same as the F-X20ZL/ZEB type with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		F-X20ZL/ZEB	TX-221Z/ZEZ	TX-220Z/ZEZ	
	Tuner assembly	GWE-231	GWE-232	GWE-232	
	FE assembly	...	AWB-063	AWB-063	
	Connector socket	...	AKX-206	AKX-206	
	Bonnet case	ANE-529	ANE-597	ANE-597	
	Front panel	ANM-846	ANY-027	ANY-067	
	Display cover	ANR-968	ANZ-111	ANZ-129	
	Display cap	ANR-969	ANZ-130	ANZ-131	
	Coaxial connector	...	AKX-090	AKX-090	
	Packing case	AHE-463	AHE-595	AHE-596	
	Nut (M12)	...	NKX2FNI	NKX2FNI	(for connector socket)
	Washer	...	WAX3F176N050	WAX3F176N050	(for connector socket)

### 3. ELECTRICAL PARTS LIST

#### NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	$56 \times 10^1$	561.....	RD4PS	561 J
47kΩ	$47 \times 10^3$	473.....	RD4PS	473 J
0.5Ω	0R5	.....	RN2H	05 K
1Ω	010	.....	RS1P	010 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	$562 \times 10^1$	5621....	RN4SR	5621 F
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- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.  
**★★ GENERALLY MOVES FASTER THAN ★**  
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

#### Miscellaneous Parts

##### P. C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	Tuner assembly	GWE-232
	FE assembly	AWB-063
	Switch assembly	Non supply
	LED assembly	Non supply

#### Tuner Assembly (GWE-232)

##### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC301	AN7470
★★	IC401	LA1260
★★	IC702	TC9157AP
★★	IC701	TD6104P
★★	IC703	TD6301AP
★	D405, D605	RD5.6EB (HZ5.6EB)
★	D401, D402,	SVC321C2/D2
★	D301, D404, D406—D410, D702—D704, D707—D709	1S1555 (US1035) (1SS131)
★★	Q304, Q407, Q408, Q605, Q607	2SA933S
★★	Q301—Q303, Q401—Q404, Q608, Q606, Q701—Q707	2SC1740S
★★	Q201	2SC2668
★★	Q406	2SK161-Y (2SK241-Y)

#### SWITCHES

Mark	Symbol & Description	Part No.
★★	S3—S11, S15, S16 Tact switch	ASG-711 (ASG-703)
	STATION CALL MEMORY FUNCTION	

#### COILS, FILTERS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	T401 AM antenna transformer	ATB-099
	L401 AM OSC coil	ATB-100
	L202 FM DET coil	ATE-072
	F202 FM ceramic filter	ATF-107
	F201 FM ceramic filter	ATF-119
	F401 AM ceramic filter	ATF-133
	F301 Beat eliminate filter	ATF-146
	L203 Inductor	ATH-116
	L201 Inductor	ATH-049

#### CAPACITORS

Mark	Symbol & Description	Part No.
	C713 (3300μF/10V)	ACH-389
	TC401, TC402 Trimmer	ACM-015
	C716	CCCCH180J50 (CCDCH180J50)
	C416, C718	CCCSL221J50 (CCDSL221J50)
	C401	CCDCH080D50
	C404, C717	CCDCH150J50
	C426	CCDSL101J50
	C422	CEANP4R7M35
	C308, C427	CEAR22M50L
	C425, C702, C709, C711, C712	CEA010M50L

Mark	Symbol and Description	Part No.
	C306, C705	CEA1R5M50L
	C418, C723	CEA100M16L
	C312, C313, C423	CEA2R2M50L
	C303, C604	CEA221M16L
	C301, C302, C307, C701	CEA3R3M50L
	C703	CEA330M16L
	C311, C414	CEA470M25L
	C720	CEA471M16L
	C714	CEA471M6L
	C309, C310, C410, C411	CKCYB102K50 (CKDYB102K50)
	C314, C315	CKCYB472K50 (CKDYB472K50)
	C316	CKCYB681K50 (CKDYB681K50)
	C305, C412, C413, C419, C710	CKCYF473Z50 (CKDYF473Z50)
	C415	CKCYX473M25 (CKDYX473M25)
	C201, C403, C420, C704, C706—C708, C721, C722, C724	CKDYF103Z50
	C214, C402, C407, C408, C715, C719, C320, C321	CKDYF223Z50
	C421	CQMA104J50
	C405	CQSA431J50
	C304	CQSA471J50

## RESISTORS

*NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.*

Mark	Symbol & Description	Part No.
★	VR401 Semi-fixed (220k)	VRTB6VS224
★	VR301 Semi-fixed (4.7k)	VRTB6VS472
△	R601	RS1LMF151J
	R720, R721 Resistor array	RA12S473J
	R421, R431, R432, R404	RD1/4PM□□□J
	Other resistors	RD1/8PM□□□J

## OTHERS

Mark	Symbol & Description	Part No.
	Termianl (ANTENNA)	AKA-024
	Terminal (AC and DC power supply/output)	AKP-083
★	V1 FL tube	AAV-028
	X701 Crystal resonator	ASS-025
	FE assembly	AWB-063

## Switch Assembly

### SWITCHES

Mark	Symbol & Description	Part No.
★★	S12, S13 Tact switch (TUNING)	ASG-711 (ASG-703)

## LED Assembly

### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D902 LED	AEL-424
★	D901 LED	AEL-382

## FE Assembly (AWB-063) (on the GWE-232)

### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D101—104	1SV147
★★	Q102	2SC2668
★★	Q105	2SC2786-L
★★	Q101, Q103, Q104	2SK241-Y
★	D110	ISS131

## COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L101 FM antenna coil	ATC-192
	T101 FM RF transformer	ATC-194
	L104 FM OSC coil	ATC-214
	L103 FM RF coil	ATC-247
	L102 FM tuning coil	ATC-248
	T102 FM coupling transformer	ATE-063
	L105, L106 Inductor	ATH-049

## CAPACITORS

Mark	Symbol & Description	Part No.
	TC101 Trimmer	ACM-014
	C115	CCDCH080D50
	C113	CCDCH150J50
	C114	CCDCH330J50
	C101	CCDRH100D50
	C105	CCDRH330J50
	C102, C104, C106	CCDRH390J50
	C108, C110	CCDSL010C50
	C109	CCDSL020C50
	C117	CCDSL050C50
	C111	CCDSL101J50
	C116	CCDTH180J50
	C103, C112, C118, C119	CKDYF103Z50
	C107	CKDYF223Z50
	C130	CEA470M25L

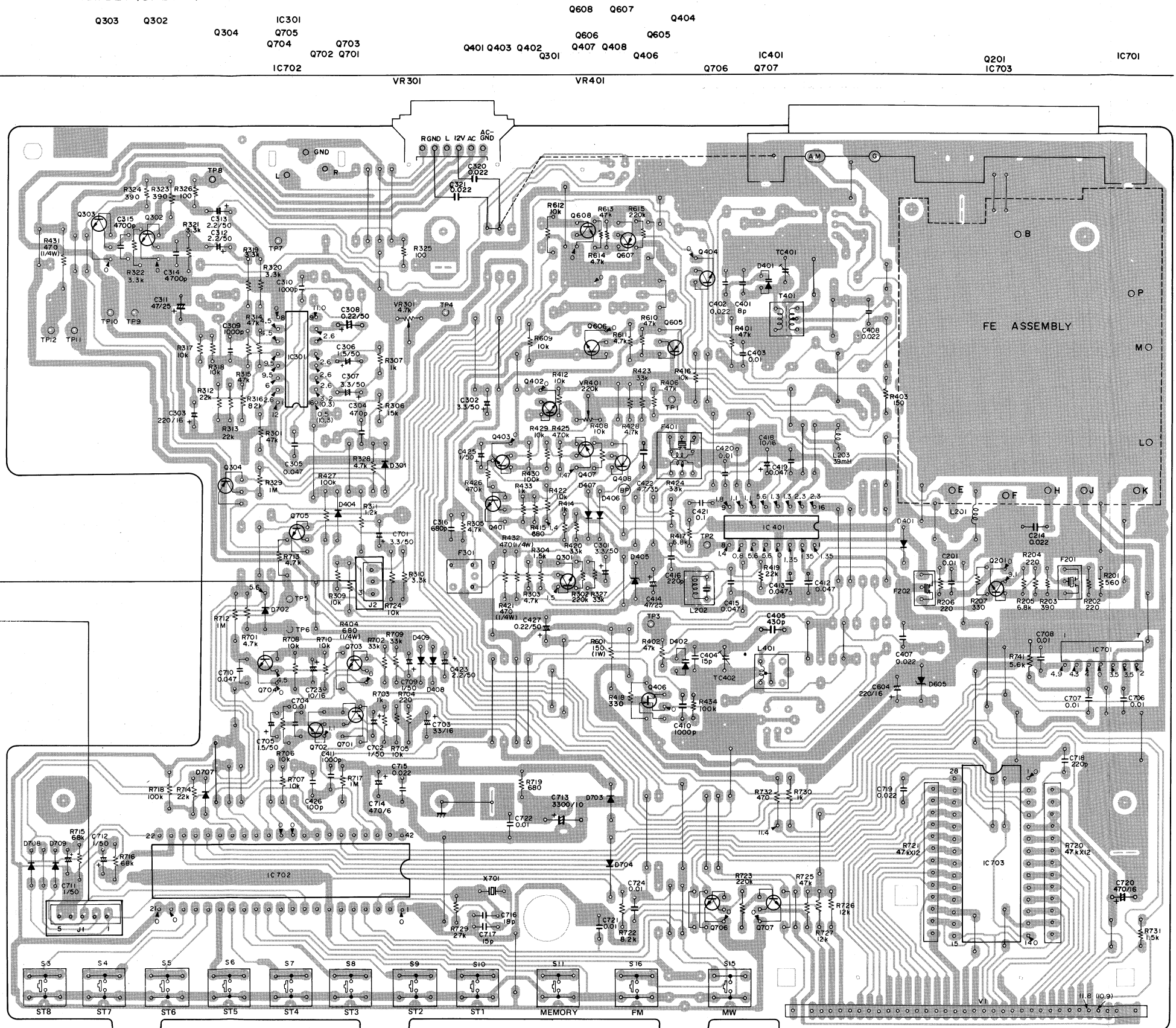
## RESISTORS

*NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.*

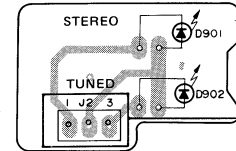
Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM□□□J

# 4. P.C. BOARDS CONNECTION DIAGRAM

TUNER ASSEMBLY (GWE-232)

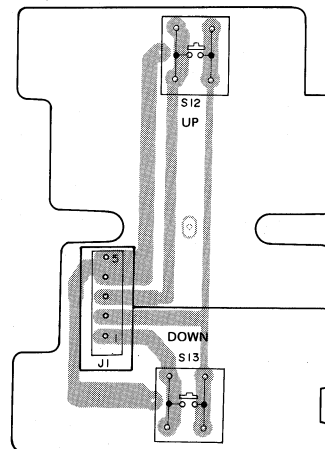


LED ASSEMBLY

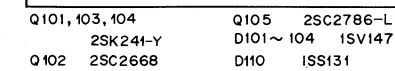


D901 AEL-382  
D902 AEL-424

SWITCH ASSEMBLY



IC 301: AN 7470  
IC 401: LA 1260  
IC 701: TD 6104P  
IC 702: TC 9157AP  
IC 703: TD 6301 AP  
D 301, 404, 406-410  
702 704, 707 709  
IS1555  
(US1035)  
(ISS131)  
D4C5, 605:  
RD5.6EB  
(H25.6EB)  
D401, 402:  
SVC321C2/D2  
Q201: 2SC2668  
Q406: 2SK161-Y  
(2SK241-Y)  
Q301, 302, 303  
401-404, 606, 608  
701-707:  
2SC1740S  
Q304, 407, 408  
605, 607:  
2SA933S



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6. ADJUSTMENTS

■ For servicing this type, please refer to the F-X20ZL adjustments in service manual (ARP-719: from page 17 to 22) with the exception of this adjustment.

● FM Tuner Section Adjustment

Step No.	FM SG (1 kHz±75 kHz dev.)		TX-221Z/ZEZ TX-220Z/ZEZ tuned frequency display	Adjustment		
	Frequency (MHz)	Level (dB)		Adjustment location	Specifications	
3	①	90	20—30	90	L102*, L103, T101	Set the output from pin 1 of the tuner assembly to maximum level. (Before performing the adjustment of Step 3, turn VR401 fully counterclockwise.)
	②	106		106	TC101, L103, T101	
	③	90		90	L102*	
	④ Repeat steps 3- ② and 3- ③ until both specification ratings are satisfied.					

\* The expression "adjust L102" found in the text means that the tuning coil is to be extended out wards with spatula (non metal) as shown in Fig. 6-2.

● Spatula (Non metal: ex. Glass-Cloth Epoxy Resin)

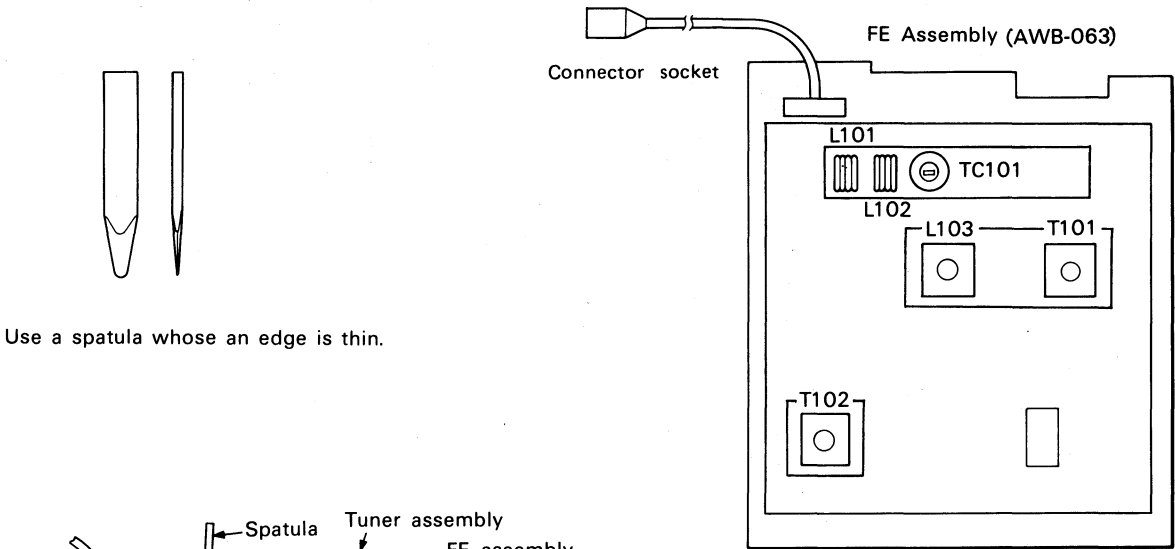


Fig. 6-1 Adjustment positions

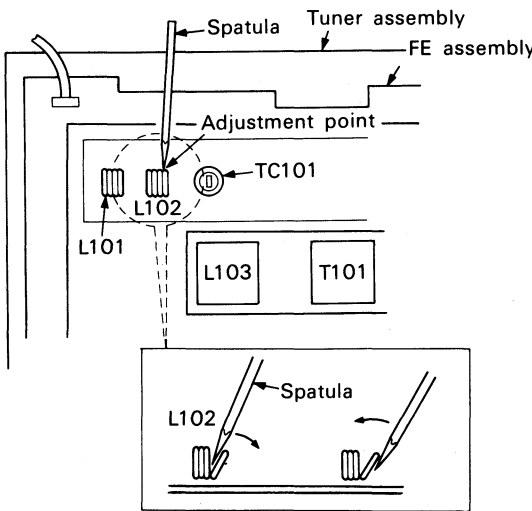


Fig. 6-2 Adjustment tuning coil L102